REMARKS

Claims 9-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Morii et al. (U.S. Patent No. 6,335,779). Applicants respectfully traverse the rejection because the cited reference does not disclose or suggest a method of making a liquid crystal display apparatus that includes, among other things, a step of determining a gradation-luminosity characteristic γ value according to a thickness of liquid crystal cells or a birefringence index of a liquid crystal layer included in the liquid crystal cells.

The Examiner cites Morii as teaching a method of manufacturing an in-plane switching liquid crystal display apparatus. Morii does not teach the gradation-luminosity characteristic γ. Rather, Morii teaches an intensity of transmission light I can be determined by $I=I_0 \sin^2(\pi R/\lambda)$, where I_0 represents an intensity of light incident on a polarizer, λ represents a wavelength, and R represents a retardation which is obtained by multiplying an optical-path difference between ordinary light and extraordinary light by a thickness of the liquid crystal ((Δn) d). More specifically, Morii teaches that the intensity of light which is outgoing from a polarizer is given by a function of wavelength, of incident light and retardation R. Thus, variations in the thickness d of liquid crystal cause variations in outgoing light intensity, *i.e.* transmission light I (Col. 3, lns. 21-38). In Fig. 1, Morii illustrates the dependency of transmittancy on wavelength for retardation values of 200, 275, and 300nm (Col. 7, lns. 9-16). Morii also teaches that retardation of an in-plane switching (IPS) panel needs to satisfy $0 \leq (\Delta n) \cdot (d_{max}-d_{min}) \leq 20nm$ in order to manufacture an IPS

panel without irregularities in colors. Morii is silent with respect to a gradation-luminosity characteristic.

In contrast, the present invention is directed to a method of making a liquid crystal display apparatus that includes, among other things, a step of determining a γ value that serves as an index for a gradation-luminosity characteristic according to a thickness of liquid crystal cells or a birefringence index of a liquid crystal layer included in the liquid crystal cells. More specifically, the present invention teaches that the gradation-luminosity characteristic γ is determined according to the following equation:

$$\gamma = \Delta n \cdot d \times 0.008 \pm 30\% \text{ and } \gamma < 1.9$$

As discussed in Applicants' specification, page 28, lines 3 at seq., if a large value is set up as the γ value, a display luminosity in a high gradation will become a low value as compared with the highest luminosity. As a result, the larger that γ becomes, the smaller the luminosity to display the same gradation will become. Consequently, an applied voltage to the liquid crystal panel will become a low value. When the product $(\Delta n)d$ in a liquid crystal panel has a large value, the γ value is set at a large value. This is equivalent to displaying a picture at a relatively low driving voltage. Further, when the γ value is set up according to the above equation, a middle tone will be displayed on driving voltages lower than the driving voltage at which the T-V characteristics in the vertical and horizontal viewing angles surge in the T-V characteristics, as shown in FIG. 32 of the present

application. Consequently, the deterioration in the contrast in slanted viewing angles for a middle tone is suppressed.

γ is a particular characteristic not taught by Morii. In addition, the constant value, namely the constant 0.008, is not disclosed or suggested by Morii. Section 2143.03 of the MEPP requires that, to establish a *prima facie* case of obviousness, each and every feature or limitation of the claimed invention must be disclosed or suggested in the prior art. The Examiner has not met this initial requirement because Morii does not disclose or suggest the 0.008 constant in the above equation, or the gradation-luminosity characteristic γ. Accordingly, for at least these reasons, withdrawal of the §103 rejection of independent claim 9 is respectfully requested.

With respect to claim 10, the arguments asserted above are reasserted herein. More specifically, Morii does not disclose or suggest a liquid crystal display apparatus that includes, among other things, a liquid crystal display apparatus that includes liquid crystal cells having a gradation-luminosity characteristic γ in the liquid crystal panel that is set to above 1.9 and within a $\pm$ 30% range of 0.008 times $(\Delta n)d$, where Δn represents the anisotropy of a refractive index and d represents the thickness of the liquid crystal cells. Since Morii fails to disclose or suggest either the gradation-luminosity characteristic γ or the constant 0.008, withdrawal of the §103 rejection of independent claim 10 and its associated dependent claims 11-12 is respectfully requested.

For all of the foregoing reasons, Applicants submit that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

GREER, BURNS & CRAIN, LTD.

By Joseph P. Fox
Joseph P. Fox
Registration No. 41,760

February 3, 2004

300 South Wacker Drive - Suite 2500
Chicago, Illinois 60606
Telephone: 312.360.0080
Facsimile: 312.360.9315
Customer Number 24978
P:\DOCS\0941\65777\425082.DOC